A Placebo-Controlled Online Study on Potential Mediators of a Pleasure-Based Positive Psychology Intervention: The Role of Emotional and Cognitive Components

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Abstract

While broad evidence exists that positive psychology interventions are effective in increasing well-being, less is known about the working mechanisms behind this process. We examine the impact of subjective changes in affectivity (i.e., elicitation of positive emotions) and cognitive processes (i.e., the gaining of insights) in three variants of a pleasure-based placebo-controlled online intervention (N = 509 adults). The variants were designed that they have (1) a cognitive focus, (2) an emotional focus, or (3) both cognitive and emotional foci. We assessed happiness and depressive symptoms before the intervention, immediately after the intervention, and at follow-ups after two weeks, one month, and three months, and collected subjective ratings on potential working mechanisms. Findings indicated that both variants with a cognitive focus increased happiness in comparison to the control condition, whereas only those interventions that fostered the experience of positive emotions reduced depressive symptoms. Positive emotions mediated the effects of the intervention on happiness and depressive symptoms, whereas insights only mediated the effects on happiness. The findings support the important role of positive emotions in positive interventions and provide new evidence for the relevance of cognitive changes in such interventions.

Keywords: positive psychology, well-being, positive emotions, positive intervention, working mechanisms, online intervention

Introduction

Positive psychology interventions are "[…] treatment methods or intentional activities that aim to cultivate positive feelings, behaviors, or cognitions" (Sin & Lyubomirsky, 2009; p. 468). Two recent meta-analyses support the notion that such interventions are effective strategies for increasing well-being and ameliorating depression (Bolier et al., 2013; Sin & Lyubomirsky, 2009). However, it is still widely unknown *how* these interventions work—namely, what mechanisms are involved in increasing well-being and reducing depression. In addition to a deepened understanding of why positive interventions work, more knowledge on working mechanisms can be important for both increasing the efficacy of current interventions and for facilitating the development of new positive interventions.

A frequently mentioned working mechanism of positive interventions in the literature is the elicitation of positive emotions (e.g., Cohn & Fredrickson, 2010; Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Gander, Proyer, Ruch, & Wyss, 2013; Martínez-Martí, Avia, Hernández-Lloreda, 2010; Otake et al., 2006; Quoidbach, Mikolajczak, & Gross, 2015; Sheldon & Lyubomirsky, 2012). According to Fredrickson's (2004) broaden-and-build theory, positive emotions broaden the thought-action repertoire and build up physical, social, intellectual, and psychological resources that might elicit further positive emotions and, thereby, create a positive upward spiral, and thus increase well-being. Lyubomirsky and Layous (2013) presented a global framework of mechanisms of positive interventions. They suggest further working mechanisms; namely, the elicitation of positive thoughts, positive behaviors, or need satisfaction. Whereas this model is a very important first step in furthering the understanding and development of positive psychology interventions, more work in this area is needed for several reasons. The proposed model presents a global framework for studying potential mediators in positive psychology interventions. However, it needs to be considered that, most likely, depending on the specific type of the intervention, different

mechanisms might play a more important role than others. The present study aims at narrowing a gap in the literature by conducting an experimental test of working mechanisms in positive interventions.

One of the most frequently used and well-validated positive psychology interventions is the "three good things"-interventions (Seligman, Steen, Park, & Peterson, 2005; see also Gander et al., 2013; Mongrain & Anselmo-Matthews, 2012; Proyer, Gander, Wellenzohn, & Ruch, 2014; Schueller & Parks, 2012). The instruction for the original intervention requires participants to "[…] write down three things that went well each day and their causes every night for one week. In addition, they were asked to provide a causal explanation for each good thing" (Seligman et al., 2005, p. 416). Several variants of the original intervention exist; for example, based on humor (i.e., "three funny things"; Gander et al., 2013), pleasure, engagement, and meaning (Giannopoulos & Vella-Brodrick, 2011), or positive relationships, and accomplishment (Gander et al., 2016). Further, there have been earlier similar exercises with comparable effects (e.g., *counting blessings*; Emmons & McCullough, 2003; this exercise requires participants to note things for which they are grateful). Some of the variants of the three good things exercise were effective for up to six months in placebo-controlled settings, but, again, comparably little knowledge exists about *how* they work. Quoidbach et al. (2015) suggested that the main working mechanism for an intervention that is comparable to the three good things-intervention (i.e., the *counting blessings exercise* by Emmons & McCullogh, 2003) is to enable a *cognitive change*—it alters the appraisal of a situation: One might gain new *appraisals* or *insights* (e.g., finding good things every day of one's life might lead to the idea that one's life is actually quite good; cf. Quoidbach et al., 2015). The question emerges on whether such an insight-component could also be found in other interventions and, especially, how this compares to the idea of positive emotions (more precisely: the

elicitation of positive emotional states and feelings by re-experiencing and savoring them) as a working mechanism.

The present study

The main aim of the present study was examining and comparing the *elicitation of positive emotions* and *cognitive changes* as potential working mechanisms of positive psychology interventions that might account for the increases in well-being. Variants of a well-established intervention that focus on each of these two working mechanisms, or a combination of both, will be compared with each other. We chose the "three pleasurable things" intervention as it is more directly related to a theoretical framework than many other interventions. The pleasurable life (a life focused on the experience of positive emotion) is one of the five components of Seligman's (2011) Well-Being Theory (and its predecessor, the Authentic Happiness Theory; Seligman, 2002).

Giannopoulos and Vella-Brodrick (2011) have developed an intervention for fostering the pleasurable life (i.e., "three pleasurable things"), a variant of the "three good things" intervention. The authors found effects for up to two weeks in a placebo-controlled design. Findings have been replicated and extended recently (Gander et al., 2016) with increases in well-being for up to six months (placebo-controlled online intervention study). Further, we opted for this exercise since "pleasurable things" are more specific than "good things", and we expected that pleasurable experiences could be more easily manipulated than other positive experiences.

We created three variants of this exercise that were aimed at experiencing the expected mechanisms to varying degrees. All variants included spending five minutes with writing down pleasurable situations experienced on that day as neutrally as possible, and ten minutes with an intervention-specific component. The first intervention condition had a *cognitive focus* (*CF*) and was closest to the original "three good things" instruction. In the instruction

the cognitive focus was emphasized and emotional aspects were reduced by instructing participants to describe *why* the pleasurable situations happened and what conclusions could be drawn in as neutral and objective terms as possible, in order to foster insight-related thoughts. The second intervention condition (*ECF*) had both an em*otional and a cognitive focus*: Participants were instructed to re-experience the emotions during the pleasurable situations and describe them in detailed and explicit terms. While this exercise did not directly target cognitive aspects, the remembering and reflecting of situations might also foster insight-related thoughts. The third intervention condition (*EF*) had an *emotional focus* only: We eliminated cognitive aspects as much as possible by avoiding the reflective element. Instead, participants in this condition were instructed to spend the full fifteen minutes of time with something pleasurable and, thus, focus solely on experiencing, but not re-experiencing positive emotions. The instructions for the three variants and the placebo control condition ("early childhood memories"; Seligman et al., 2005) are shown in Table 1 (translated from German).

Insert Table 1 about here

Before the intervention, after the intervention, and at follow-ups after two weeks, one month, and three months, participants in all conditions completed measures on well-being and depressive symptoms. Additionally, participants were asked immediately following the intervention to what extent the assigned exercise elicited *positive emotions* or *insights*.

In this study, we used a broad conceptualization of well-being that covers aspects of both subjective well-being (i.e., being satisfied with one's life and often experiencing positive and rarely negative affect) and psychological well-being (i.e., positive psychological functioning, such as perceiving meaning in one's life or having positive relationships).

We hypothesized that all interventions would increase well-being and ameliorate depressive symptoms. However, we expected stronger effects for CF and ECF, than for EF, since we anticipated that changes on a more cognitive level are relevant for more sustainable increases in well-being. Further, we assumed that participants in CF would report the highest level of insights, followed by ECF and EF. Also, we assumed that those in EF would report the highest level of positive emotions (in the posttest measure), followed by ECF and CF. Finally, we also expected that positive emotions in the posttest measure and insights would mediate the effect of the intervention on well-being and depressive symptoms.

Method

Participants

A total of n = 1,351 participants registered on a website offering a free positive psychology intervention program, and n = 1,002 participants provided basic demographic information, and completed the baseline measures. Of these, 95 participants were excluded since they did not fulfill the inclusion criteria (n = 45; see below) or showed implausible response patterns (e.g., the same ratings for all items or contradictory ratings; n = 50). The remaining 907 participants were randomly assigned to one of three intervention conditions or the placebo control condition. The final sample consisted of N = 509 participants (aged 19 to 86; M = 48.16, SD = 12.56) who completed the assigned exercise and all follow-ups. The detailed flow of participants is given in Figure 1.

Insert Figure 1 about here

Most participants were women (82.7%) of German (62.3%), Swiss (27.5%), or Austrian (7.3%) nationality. More than half of the sample identified as being in a partnership (67.6%), 18.5% were single, 10.8% were divorced or separated, and 3.1% were widowed. The

majority of the sample (59.9%) held a degree from a university or a university of applied sciences, and 20.0% held a diploma allowing them to attend these schools; 17.5% had completed vocational training, and 2.6% had completed secondary education.

Instruments

The *Authentic Happiness Inventory* (AHI, Seligman et al., 2005; used in the German version as in Ruch et al., 2010) is a subjective measure for the assessment of global well-being comprising aspects of subjective and psychological well-being. It utilizes 24 sets of five statements (e.g., ranging from 1 = "I feel like a failure" to 5 = "I feel I am extraordinarily successful") from which one statement has to be selected that most aptly describes one's feelings in the past week. Proyer, Gander, Wellenzohn and Ruch (2017) report good psychometric properties and support its usefulness in intervention studies due to its sensitivity to upward changes in well-being. The AHI has often been used in research (e.g., Proyer et al., 2014; Ruch et al., 2010; Schiffrin & Nelson, 2010; Schueller & Seligman 2010; Shapira & Mongrain, 2010). Internal consistency at pretest was high (α = .93).

The *Center for Epidemiologic Studies Depression Scale* (CES-D, Radloff, 1977; in the German adaptation by Hautzinger & Bailer, 1993) is a 20-item measure for the subjective assessment of the frequency of depressive symptoms in the past week. All items use a 4-point Likert-type scale ranging from 0 = "*rarely or none of the time (less than 1 day)*" to 3 = "*most or all of the time (5-7 days)*", and four of the 20 items are negatively keyed. A sample item is "I felt sad". The CES-D is among the most frequently used measures for depression screening. The internal consistency in the present study at pretest was high (α = .90).

For examining subjective changes due to the intervention, two single, face-valid items were created, assessing the proposed working mechanisms of positive emotions ("To what extent did the exercise elicit positive emotions?"), and the cognitive aspects of gaining new insights ("To what extent did the exercise elicit new insights?"). Both items were rated at the

posttest on a 10-point Likert-type scale ranging from 0 = “not at all” to 9 = “to a very high extent”.

Procedure

The study was conducted on a website affiliated with an institute of higher education. We recruited participants via press releases in several newspapers and magazines that included a call for participation in a positive psychology intervention program. The program was advertised as a training program for character strengths and other positive traits. Participants could self-register on the website by indicating that they fulfill the inclusion criteria (i.e., at least 18 years of age, currently not undergoing psychotherapeutic or psychopharmacological treatment, and not having professional interest in participation) and giving informed consent. Registered participants had to complete basic demographic information and were asked again whether they fulfill the inclusion criteria. If they indicated that they did not, they were excluded from all further analyses. Participants could decide for themselves when to start the training program. As soon as they did so, they had to complete the baseline measurement of the dependent measures (i.e., AHI, CES-D), were randomly assigned to one of the four conditions (using an automated algorithm based on a Mersenne-Twister), and received their assigned exercise that had to be conducted every day for one week. Directly after the week of the intervention, as well as two weeks, one month, and three months afterwards, participant completed follow-ups of the dependent measures. Additionally, participants were asked after the intervention week to what extent the exercise elicited positive emotions, or led to new insights (single item ratings), and whether or not they completed the assigned exercise. Those who indicated that they did not complete the exercise were excluded from subsequent analyses. After the end of the program, participants received an individualized, automated feedback on their scores in the completed questionnaires.

Results

Preliminary analyses

Firstly, we conducted an analysis of the dropouts. Those participants who completed all assignments were on average 2 years older, reported higher well being, and were less depressed at baseline (age: $t[905] = -2.46$, $p = .02$, $d = .16$; well-being: $t[905] = -4.60$, $p = .01$, $d = .31$; depression: $t[905] = 3.84$, $p < .001$, $d = .26$) than those who dropped out of the study. However, there was no differential dropout rate among the conditions, χ^2 (3, $N = 907$) = 2.09, $p = .55$. Nonetheless, the remaining sample was highly comparable to data collected in German-speaking samples for well-being (Proyer et al., 2017) and the general population for depression (Hautzinger & Bailer, 1993).

Secondly, we tested whether randomization was successful. The four conditions did not differ regarding demographics (age: $F[3, 505] = 1.69$, $p = .17$; gender ratio: χ^2 [3, $N = 509$] = 2.30, $p = .51$; relationship status: χ^2 [9, $N = 509$] = 13.14, $p = .16$; education: χ^2 [9, $N = 509$] = 14.95, $p = .09$), nor in the baseline scores of the dependent variables (well-being: $F[3, 505] = 1.53$, $p = .21$; depression: $F[3, 505] = 1.40$, $p = .24$)[1].

Changes in Well-being and Depressive Symptoms

Means and standard deviations for the conditions at the different time points are given in Table 2.

Insert Table 2 about here

Table 2 shows that mean scores for well-being increased and depressive symptoms decreased from the pretest to the subsequent time points. For testing whether the changes in the intervention conditions exceed those in the placebo control condition, we compared each

[1] The following analyses were not controlled for demographic variables since there were no differences among the conditions. However, results would remain the same when including all demographic information as control variables.

intervention condition separately with the placebo control condition. In a series of ANCOVAs, we checked for effects of the condition across all time points after the intervention ("Overall"), as well as for every time point separately, while controlling for the baseline scores of well-being and depressive symptoms (Table 3).

Insert Table 3 about here

Table 3 shows that in comparison with the placebo control condition (PCC), well-being increased in both conditions with a cognitive focus (CF and ECF). Additionally, in the condition that had both an emotional and a cognitive focus (ECF), well-being was higher than in the PCC at all time points. In the condition that mainly focused on cognitive mechanisms (CF), we observed changes at the immediate posttest and at the follow-up after three months. We found no differences from the PCC in the condition that mainly focused on emotional mechanisms (EF). For depressive symptoms, a different pattern was observed: Whereas no amelioration in depressive symptoms was observed in the condition that mainly focused on cognitive mechanisms (CF), both conditions with an emotional focus (ECF and EF) reported a reduction in depressive symptoms, however, this finding was limited to only the immediate posttest. Further, as expected, CF and ECF showed stronger increases in well-being than EF as well ($F[1, 363] = 3.71$, $p = .03$, $\eta^2 = .01$), whereas no effects for depressive symptoms were found ($F[1, 363] = 0.22$, $p = .64$).

Subjective Changes due to the Interventions

Next, we examined whether the hypothesized differences in the working mechanisms were also reflected in participants' subjective ratings that were collected at the posttest. Means and standard deviations of the ratings and their differences are given in Table 4.

Insert Table 4 about here

Inspecting the mean scores shows that, as expected, participants in all intervention conditions reported subjective levels of positive emotions and insights of medium size (scores > 5 on a scale from 0 to 10). As expected, the condition that mainly focused on emotional mechanisms reported the numerically highest scores of positive emotions, followed by ECF, whereas CF reported the lowest scores. For insights, the expectations were also confirmed: The highest scores were reported by CF, followed by ECF and EF. However, analyses of the absolute scores showed no statistically significant differences among the groups, neither for positive emotions ($F[2, 363] = 1.98, p = .14$), nor for insights ($F[2, 363] = 0.83, p = .44$). However, when checking for relative differences between the ratings in a repeated measurement ANOVA (within-factor: positive emotions and insights; between-factor: condition), the results showed that the differences between positive emotions and insights varied among the conditions ($F[2, 363] = 6.49, p = .002, \eta^2 = .03$). Subsequent simple effects analyses showed that, as expected, more insights than positive emotions were reported in CF ($F[1, 363] = 11.33, p < .001$), more positive emotions than insights were reported in EF ($F[1, 363] = 2.96, p = .04$; one-tailed tests), whereas no differences in the levels of positive emotions and insights were found in ECF ($F[1, 363] = 1.10, p = .30$).

Mediation Analyses

For examining the role of the suggested working mechanisms in the increase of well-being and the reduction of depressive symptoms, we conducted a series of multiple mediation analyses. We used bootstrapping (with $z = 5{,}000$ samples) for computing 95% confidence intervals of indirect effects (Preacher & Hayes, 2008). The independent variable was the condition (0 = placebo control condition; 1 = intervention condition), the dependent variables were well-being or depressive symptoms, and the mediators were the subjective changes in

positive emotions and insights, while controlling for the baseline scores in well-being or depressive symptoms. Standardized indirect effects are given in Table 5.

Insert Table 5 about here

Table 5 shows that for overall changes in well-being, both positive emotions and insights mediated the relationship between the condition and well-being. However, different patterns were obtained when inspecting the time points separately: At the posttest, for example, positive emotions played a role in all intervention conditions, whereas effects for insights were only found in EF. At the two-weeks follow-up, insights were relevant in all conditions, whereas positive emotions only showed an effect in CF. For depressive symptoms, positive emotions showed mediating effects in all conditions at the posttest and at the follow-ups after two weeks and one month. There were no mediating effects of insights for depressive symptoms.

Discussion

The study provides support for the notion of the important role of positive emotions in a pleasure-based positive intervention and provided additional empirical support for the role of cognitive changes in positive interventions. The study aimed at comparing three variants of the "three pleasurable things"-intervention that emphasize the experience of positive emotions and cognitive change (insights) to varying degrees. This also provides support for the model proposed by Lyubomirsky and Layous (2013) and earlier work done on these variables (e.g., Cohn & Fredrickson, 2010; Quoidbach et al., 2015).

In line with expectations, two instructions that aimed at eliciting cognitive changes (cognitive focus/CF and emotional and cognitive focus/ECF) increased overall well-being in comparison with a placebo-control exercise, and showed stronger increases in well-being than

a condition without the cognitive aspects (emotional focus/EF). When inspecting the individual time points, the ECF condition differed at all time points from the control condition, whereas the CF condition only showed effects for well-being at the immediate posttest and at the three months follow-up. However, the happiness scores remained more or less constant in the CF condition at these time points (while the control condition showed small increases). Thus, although the comparison between the conditions did not yield statistical significant results, the gains in the CF conditions were maintained.

Contrary to our expectations, no effects on well-being were found for the condition that only aimed at increasing positive emotions and avoided cognitive aspects (EF). However, two out of our three expectations with regard to depressive symptoms were confirmed: Only the conditions that included emotional aspects (ECF and EF) were effective in reducing depressive symptoms. Further, the study provides preliminary evidence that both positive emotions and insights might mediate the relationship between the condition and well-being, but only positive emotions are involved in the mediation of depressive symptoms.

Thus, the study suggests that interventions that mainly elicit positive emotions are not a sufficient sustainable strategy for increasing well-being if they are not accompanied by components that allow for cognitive changes, such as gaining new insights. This finding might represent an important addition to models that aim at explaining the increase in well-being following positive change (e.g., Sheldon & Lyubomirsky, 2012). For the reduction of depressive symptoms, however, the opposite seems to be true based on the findings of this study. Findings also show that positive emotions played an important role in the reduction of depressive symptoms, this was not the case for cognitive changes. Nevertheless, we do not argue that cognitive changes are not important for the amelioration of depressive symptoms. This finding also needs to be interpreted with respect to the measure used in this study for the assessment of depressive symptoms (CES-D; Radloff, 1977). This scale has an emphasis on

the emotional aspects of depression, while omitting the more cognitive dimensions of depressive symptoms. Thus, it is possible that different results would be obtained with a more nuanced depression measure that more specifically examines both the emotional and cognitive facets behind depression.

The main aim of the present study was to create instructions that emphasize particular working mechanisms while minimizing the contribution of other components. As a limitation, it needs to be noted that it seems not entirely possible to fully disentangle these mechanisms from each other—especially, in web-based settings where there is only limited control on how participants work with the activities. As expected, comparable increases in levels of positive emotions and insights are reported when writing down pleasurable things, regardless of whether the instruction emphasizes emotional aspects or cognitive aspects. Thus, we argue that those different potential working mechanisms influence and promote each other. One of the aims of future studies should, therefore, be further examining the interplay between changes on emotional and cognitive levels as working mechanisms in positive psychology interventions in order to further the understanding of how these interventions work, and foster the development of more effective and sustainable interventions.

The present study has only addressed potential working mechanisms in pleasure-based variants of the "three good things"-intervention. It can be assumed that depending on the context of the intervention, other working mechanisms might be more important. When using Seligman's (2011) Well-Being Theory as a framework for intervention studies, it can also be assumed that the elicitation of positive emotions plays a more important role in pleasure-based interventions than in interventions that aim at fostering engagement, meaning, positive relationships, or accomplishment (cf. Gander et al., 2016, 2017).

Several limitations have to be noted. Firstly, the present study is only an initial examination of the proposed working mechanisms. Thus, the findings warrant replication.

Also, we focused on two potential working mechanisms and did not consider other possible factors that were suggested by Lyubomirsky and Layous (2013). Further, more potential working mechanisms that are not considered by Lyubomirsky and Layous (2013), such as an attentional shift (Wellenzohn, Proyer, & Ruch, 2016) could also play an important role. Also, the results for the CF condition should be interpreted with caution since they differed from the control condition at the posttest and at the 3 months follow-up, but not at the follow-ups in between. Secondly, the generalizability of the findings is limited due to the differences in demographics and well-being between those participants who completed the intervention and all measurement periods, and those who failed to do so. Also, the used sample was self-selected and can therefore not be considered representative. Although our sample did not differ in their well-being or depression scores from what would be expected from a general population sample, it can be assumed that those who participate in a self-administered intervention study have a high motivation for change. The larger dropout in those with higher scores in depressive symptoms means that those who might benefit most from such interventions (e.g., Sin & Lyubomirsky, 2009) tend not to complete it. Thus, future studies should examine whether the same effects are found when testing participants with elevated depression scores by working more closely together with the participants in order to prevent dropouts. Also, the person × intervention-fit needs to be taken into account (Schueller, 2012; Proyer, Wellenzohn, Gander, & Ruch, 2015, 2016). Further, we only analyzed the data of the participants who completed the assigned exercise and all follow-ups. This procedure was selected in order to increase the internal validity of this study (while taking into account the consequences for ecological validity), since we were interested in differences among those participants who completed the assigned exercises (or the placebo control exercise) as instructed. Further, estimating missing values was also ruled out due to the large amount of dropouts, which is a common problem in online intervention studies (e.g., Mitchell, Vella-

Brodrick, & Klein, 2010). Thirdly, we did not collect the participants' notes and, therefore, do not know how well they had complied with the instructions and whether the productions (or activities) truly reflect the instructions. Fourthly, it was not possible to create fully parallel intervention conditions. For example, whereas in CF and ECF participants were instructed to complete the writing component of recording their experiences throughout the day first, and then completed the intervention-specific component, this sequence had to be reversed for EF. Fifthly, we used one-item self-report measures for the assessment of the potential working mechanisms. Although this is a useful approach for an initial study, there is the downside that such measures are hardly reliable and effects are probably underestimated, and the use of better instruments is advised, such as assessing a range of discrete positive emotions on a daily basis. Further, the suggested mediators were only collected at one time point, and no conclusions about direction or causality of the relationship between positive emotions and insights with well-being or depressive symptoms can be made. Finally, it is possible that the interventions affect well-being also via automatic, or unconscious processes that can therefore not be measured via self-report measures that directly ask about conscious changes.

Conclusion

The present study has two major outcomes: (1) The findings support the notion of an important role of positive emotions in a pleasure-based positive psychology intervention, (2) but also provided evidence for the role of cognitive changes, such as gaining new insights, in positive psychology interventions.

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Table 1

Descriptions of the Three Intervention Conditions and the Placebo Control Condition.

Label	Focus	Instruction
		Please take 15 minutes on every evening for a week after dinner …
CF	Cognitive Focus	Firstly, spend 5 minutes to write down what situations you have experienced today that elicited pleasure, joy, and fun. Describe these situations in keywords and as neutral and objective as possible. Secondly, spend 10 minutes to write down why these situations happened and what conclusions could be drawn, as neutral and objective as possible.
ECF	Emotional & Cognitive Focus	Firstly, spend 5 minutes to write down what situations you have experienced today that elicited pleasure, joy, and fun. Describe these situations in keywords and as neutral and objective as possible. Secondly, spend 10 minutes to re-experience your emotional state in these situations as lively and intensive as possible and write down your feelings as extensive as possible.
EF	Emotional Focus	Firstly, spend 10 minutes with an activity that you would not have conducted otherwise and that elicits pleasure, joy, and fun. Secondly, spend 5 minutes to describe in keywords what you just did as neutral and objective as possible.
PCC	Early memories	Remember one early childhood memory and write down this memory as detailed as possible.

Note. IC = Intervention condition. PCC = Placebo control condition.

Table 2

Means and Standard Deviations of the Four Conditions at the Five Time Periods for Well-being and Depressive Symptoms.

		Pre		Post		2 Weeks		1 Month		3 Months	
	N	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
						Well-being					
CF	123	75.36	13.20	78.24	13.20	78.00	14.64	78.72	14.16	80.16	13.68
ECF	119	76.32	12.96	79.44	13.44	79.68	14.16	80.40	13.92	80.16	15.36
EF	124	73.44	12.72	75.84	12.72	75.60	13.20	75.60	13.20	76.32	13.92
PCC	143	76.56	11.76	77.52	12.00	78.00	12.48	78.48	13.44	77.52	12.72
						Depressive Symptoms					
CF	123	12.20	9.00	10.60	9.40	10.60	9.60	10.20	9.20	10.60	9.20
ECF	119	11.60	8.40	8.80	7.60	9.00	8.40	8.60	7.60	9.60	8.20
EF	124	13.80	8.80	10.00	7.80	10.60	9.00	10.80	9.20	11.20	8.20
PCC	143	13.00	8.80	11.40	9.20	10.60	8.20	10.60	8.80	11.60	10.20

Note. Well-being = Authentic Happiness Inventory, Depression = Center for Epidemiologic Studies Depression Scale. CF = Cognitive Focus, ECF = Emotional & Cognitive Focus, EF = Emotional Focus, PCC = Placebo Control Condition.

Table 3

ANCOVA Results for Comparisons Between the Intervention Conditions and the Placebo Control Condition in Well-being and Depressive Symptoms, Controlled for the Baseline Scores in Well-being and Depressive Symptoms.

		Overall		Post		2 Weeks		1 Month		3 Months	
	df	*F*	η^2	*F*	η^2	*F*	η^2	*F*	η^2	*F*	η^2
					Well-being						
CF	1, 263	4.60*	.02	2.91*	.01	0.95	–	1.16	–	10.96***	.04
ECF	1, 259	6.30**	.02	5.29*	.02	3.61*	.01	4.41*	.02	5.55**	.02
EF	1, 264	0.28	–	0.77	–	0.00	–	0.05	–	1.17	–
					Depressive Symptoms						
CF	1, 263	0.02	–	0.35	–	0.73	–	0.00	–	0.53	–
ECF	1, 259	3.04*	.01	4.20*	.02	0.58	–	1.66†	.01	1.46	–
EF	1, 264	2.30†	.01	6.58**	.02	0.30	–	0.07	–	1.34	–

Note. $N = 509$. Well-being = Authentic Happiness Inventory, Depression = Center for Epidemiologic Studies Depression Scale. CF = Cognitive Focus, ECF = Emotional & Cognitive Focus, EF = Emotional Focus, PCC = Placebo Control Condition

†$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$ (one-tailed).

Table 4

Means and Standard Deviations of Ratings on Positive Emotions, Insights, and Their Difference at the Posttest.

	Positive Emotions		Insights		Difference	
	M	*SD*	*M*	*SD*	*M*	*SD*
CF	5.62	2.01	6.20	1.85	0.58	1.69
ECF	5.97	2.14	6.10	1.96	0.12	1.86
EF	6.11	1.89	5.87	2.27	-0.24	1.81

Note. $N = 366$. Difference = Difference between the rating for Positive Emotions and Insights. CF = Cognitive Focus, ECF = Emotional & Cognitive Focus, EF = Emotional Focus.

Table 5

Standardized Indirect Effects of Positive Emotions and Insights in the Relationship between the Condition (Placebo Control vs. Intervention) and Well-being and Depressive Symptoms After the Intervention, Controlled for Baseline Well-being Scores.

		Overall		Post		2 Weeks		1 Month		3 Months	
	df	PE	IN	PE	IN	PE	IN	PE	IN	PE	IN
						Well-being					
CF	1, 263	.03*	.02*	.05*	.00	.02*	.03*	.03*	.02*	.02	.02
ECF	1, 259	.03*	.02*	.05*	.00	.03	.02*	.04*	.01	.02	.02
EF	1, 264	.03*	.01*	.05*	.01*	.02	.01*	.02	.01	.02	.01*
						Depressive Symptoms					
CF	1, 263	-.03*	.00	-.07*	.00	-.03*	-.01	-.03*	.00	-.01	-.02
ECF	1, 259	-.04*	.00	-.07*	.00	-.03*	.00	-.04*	.01	.00	-.02
EF	1, 264	-.04*	.00	-.09*	.00	-.03*	.00	-.03*	.00	-.02	-.01

Note. $N = 509$. PE = Positive Emotions, IN = Insights. CF = Cognitive Focus, ECF = Emotional & Cognitive Focus, EF = Emotional Focus. An asterisk indicates that the bootstrapped 95% confidence interval did not include zero.

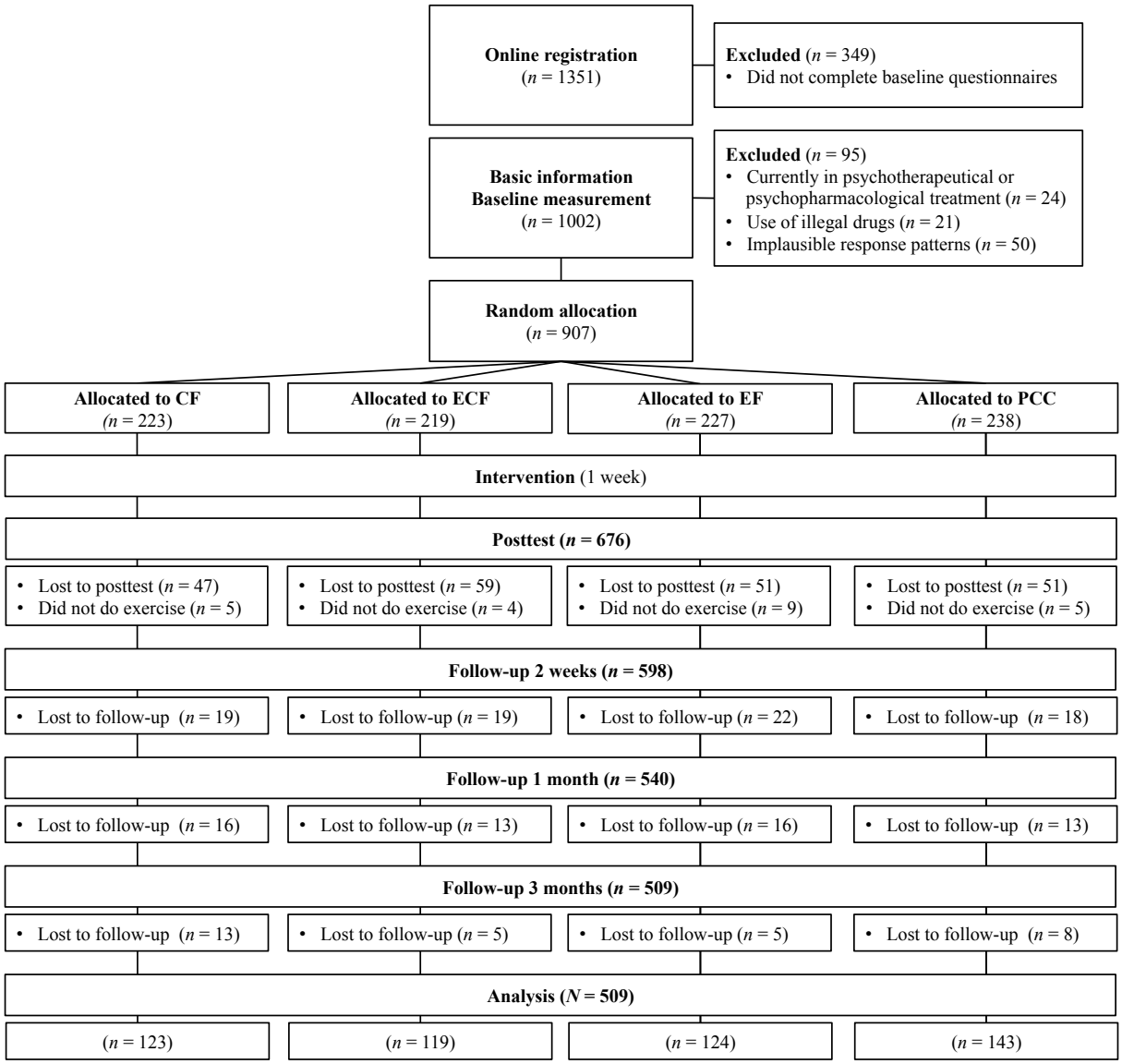

Figure 1. Flow of Participants through each stage of the study. CF = Cognitive Focus, ECF = Emotional & Cognitive Focus, EF = Emotional Focus, PCC = Placebo Control Condition.